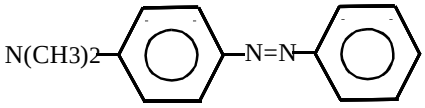
DIMETHYL AMINOAZOBENZENE

Dimethyl aminoazobenzene is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 60-11-7

Molecular Formula: $C_{14}H_{15}N_3$



Dimethyl aminoazobenzene occurs as yellow crystalline leaflets. It is insoluble in water and soluble in alcohol, benzene, chloroform, ether, petroleum ether, strong mineral acids, oils, and very soluble in pyridine (HSDB, 1991; Merck, 1989).

Physical Properties of Dimethyl aminoazobenzene

Synonyms: 4-dimethylaminoazobenzene; butter yellow; methyl yellow; N,N-dimethyl-4-(phenylazo)benzenamine; N,N-dimethyl-p-phenylazoaniline

Molecular Weight:	225.28
Melting Point:	114 - 117 °C
Vapor Pressure:	3.3×10^{-7} mm Hg
Log Octanol/Water Partition Coefficient:	4.58
Conversion Factor:	1 ppm = 9.2 mg/m^3

(HSDB, 1991; Merck, 1989; U.S. EPA, 1994a)

SOURCES AND EMISSIONS

A. Sources

Dimethyl aminoazobenzene was previously used to color polishes, polystyrene, and soap. It was also used as a chemical indicator for free hydrogen chloride in gastric juice and as a pH indicator. Dimethyl aminoazobenzene is not currently produced or used commercially in the United States (NTP, 1994).

B. Emissions

No emissions of dimethyl aminoazobenzene from stationary sources in California were reported, based on data obtained from the Air Toxics “Hot Spots” Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

No information about the natural occurrence of dimethyl aminoazobenzene was found in the readily-available literature.

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of dimethyl aminoazobenzene.

INDOOR SOURCES AND CONCENTRATIONS

No information about indoor sources and concentrations of dimethyl aminoazobenzene was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

Dimethyl aminoazobenzene is expected to exist in the particle phase in the atmosphere, and hence be subject to wet and dry deposition. The average half-life and lifetime for particles in the troposphere is estimated to be about 3.5 days and 5 to 15 days, respectively. Photolysis may also be significant (Atkinson, 1995).

AB 2588 RISK ASSESSMENT INFORMATION

Since no emissions of dimethyl aminoazobenzene from stationary sources in California have been reported under the AB 2588 program, it was not listed in any of the risk assessments reviewed by the Office of Environmental Health Hazard Assessment.

HEALTH EFFECTS

Probable routes of human exposure to dimethyl aminoazobenzene are inhalation and dermal contact (NTP, 1994).

Non-Cancer: Inhalation exposure to dimethyl aminoazobenzene may cause eye and respiratory system irritation. It may cause dermatitis upon direct contact (Sittig, 1991).

The United States Environmental Protection Agency (U.S. EPA) has not established a Reference Concentration (RfC) or an oral Reference Dose (RfD) for dimethyl aminoazobenzene. A U.S. EPA risk assessment is undergoing internal review and may result in the establishment of a RfC (U.S. EPA, 1994a).

No information is available on adverse reproductive or developmental effects in humans exposed to dimethyl aminoazobenzene. Offspring of mice exposed to 4-dimethyl aminoazobenzene were reported to have birth defects (U.S. EPA, 1994a).

Cancer: No information is available on the carcinogenic effects of dimethyl aminoazobenzene in humans. Liver and bladder tumors were increased in animals orally exposed to dimethyl aminoazobenzene. The U.S. EPA has placed dimethyl aminoazobenzene (4-dimethyl aminoazobenzene) in Group B2: Probable human carcinogen (U.S. EPA, 1994a). The International Agency for Research on Cancer has placed dimethyl aminoazobenzene (para-dimethyl aminoazobenzene) in Group 2B: Possible human carcinogen (IARC, 1987a).

The State of California has determined under Proposition 65 that dimethyl aminoazobenzene (4-dimethyl aminoazobenzene) is a carcinogen (CCR, 1996). The inhalation potency factor that has been used as a basis for regulatory action in California is 1.3×10^{-3} (microgram per cubic meter)$^{-1}$ (OEHHA, 1994). In other words, the potential excess cancer risk for a person exposed over a lifetime to 1 microgram per cubic meter of dimethyl aminoazobenzene is estimated to be no greater than 1,300 in 1 million. The oral potency factor that has been used as a basis for regulatory action in California is 4.6 (milligram per kilogram per day)$^{-1}$ (OEHHA, 1994).